UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,627	10/31/2003	Alec J. Babiarz	NOR-1147	3066

37172 7590 09/17/2008

WOOD, HERRON & EVANS, LLP (NORDSON)
2700 CAREW TOWER
441 VINE STREET
CINCINNATI, OH 45202

EXAMINER	
TADAYYON ESLAMI, TABASSOM	
ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
09/17/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

krooney@whepatent.com
mhines@whepatent.com
usptodock@whepatent.com

Office Action Summary	Application No.	Applicant(s)	
	10/699,627	BABIARZ ET AL.	
	Examiner	Art Unit	
	TABASSOM TADAYYON ESLAMI	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1-4, 6-12, 14-17, and 19-26*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-4, 6-12, 14-17, and 19-2* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 21reffer to "the device" as the device in which is dispense the viscous material to a surface of a substrate. Claim 22 refer to "the device" as a device attached to the substrate which is being coated by the dispenser.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mathias et al patent number 5,565,241 (hereafter '241) in view of Messerly et al patent number 6,253,957 B1 (hereafter '957).

'241 teaches a method of noncontact dispensing (col 6, line 17-19) a viscous material onto a surface of a substrate (col 3, lines 24-33), the method comprising: providing a jetting valve having a nozzle (fig 2, (1)) directing the viscous material flow in a jetting direction nonperpendicular fig 2, (col 8, lines 14-19), to the surface of the

substrate; (the spray is conical, the substrate is flat, therefore, some spray must be nonperpendicular).

a) Causing the jetting valve to propel a flow of the viscous material through the nozzle with a forward momentum in the jetting direction;

b) breaking the flow of the viscous material using the forward momentum to form a droplet (fig 2, col 3, line 38-42) of the viscous material; and

c) applying the droplet of the viscous material to the surface of the substrate, a wetted area on the substrate produced by the droplet being reduced by the jetting direction being nonperpendicular to the surface of the substrate (col 3 lines 62-66, col 4, line 14-16). (Note that the droplets on figure 2 have a flow shape that is substantially conical due to the atomizing holes. Also, the substrate could be either horizontal or vertical. Therefore, at least some droplets travel nonperpendicular with respect to the substrate in vertical or horizontal position). '241 does not teach droplet made by valve seat and valve elements.

However, '957 teach a suitable apparatus for forming droplets that comprises a valve seat and a valve closure element (figure 3,4 and 5) ; the valve member (valve end, fig 3) will compress the valve seat material (fig 4) and block the outlet bore(nozzle, 40') as a minute droplet is dispensed (fig 5, 200A') [col 4, lines 26-29] while continuing to push the liquid material out of the nozzle downstream of the valve seat [figs. 3-5]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the valve of '957 to apply the droplets of applicant because '957 teaches that it is a suitable apparatus for droplet application.

2. Claims 1-4, 6-12, 14-17, and 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hynes et al (U. S. Patent number 6,447,847 B1, hereafter '847), in view of Hogan et al (US Patent number 5,294,459, hereafter '459) further in view of Messerly et al. patent number 6,253,957 B1 (hereafter '957) as applied to claim 1.

With respect to claim 1, '847 teaches a method of noncontact dispensing a material onto a surface of a substrate (fig 6, 32), the method comprising:
providing a jetting valve (fig 4, 44) having a nozzle (fig 4, 32) directing the material flow in a jetting direction nonperpendicular, to the surface of the substrate (fig 6, (42,32));
a) causing the jetting valve to propel a flow of the material through the nozzle with a forward momentum in the jetting direction;
b) breaking the flow of the viscous material using the forward momentum to form a droplet of the material; and
c) applying the droplet of the material to the surface of the substrate, a wetted area on the substrate produced by the droplet being reduced by the jetting direction being nonperpendicular to the surface of the substrate.
'847 further teach that the sprayed material is acrylic, urethane or silicon used to deposit conformal coating on circuit board (col. 1, line 18-20).
'847 do not teach that the material is viscous (i.e. has a viscosity greater than 50 centipoises (cp), as define by applicant in the background of the invention [0002].
'459 teaches that when spraying urethanes, acrylics or silicones on printed circuit boards, the composition should have viscosity greater than 60cp to avoid use of hazardous solvents (col. 2, lines 39-55, col.8, lines 3-20). Therefore it would have been

obvious to one of ordinary skills in the art at the time the invention was made to have used a viscous material in the spraying method of Hynes because Hogan teaches that the sprayed materials should have high viscosities to have avoided use of hazardous solvents. '847 and '459 does not teach droplet made by valve seat and valve elements.

However, '957 teach a suitable apparatus for forming droplets that comprises a valve seat and a valve closure elements; the valve member will compress the valve seat material and block the outlet bore as a minute droplet is dispensed [col 4, line 26-29]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the valve of '957 to apply the droplets of applicant because '957 teaches that it is a suitable apparatus for droplet application.

With respect to claim 2, '847 teaches a positioner (fig 4, 26) supporting the jetting valve (32) and being operable to move the jetting valve in a first axis of motion (fig1). (The first axis of motion correspond to the Y axis that is: the movement is from left to right, therefore the positioner supporting the jetting valve and being able to slide left and right along the Y axis (col 2, line 47-49). Moving the jetting valve in the first axis of motion with respect to the substrate (col 2, line 49-52): and simultaneously (col 3, lines 58-62); Iterating the steps of causing, thereafter causing, breaking and applying to apply a pattern of the viscous material on the substrate (col 2, line 55-59).

Claim 3 has all the limitations of claim 2, '847 teaches the first axis of motion being linear (see discussion above) and the pattern of the viscous material on the substrate is a linear pattern (32) [col 1, lines 66-67]; (it is a conformal coating being

applied to a square object, therefore the coating conforms to the linear edges of the object).

Claim 4 has all the limitations of claim 2, '847 teaches the substrate (fig 6, (42)) supporting a device (fig 6, (40)) having a sidewall separated from the surface of the substrate by a gap (area between the legs of 40), the sidewall being nonparallel to the surface of the substrate and substantially parallel to the first axis of motion (fig 6, (left side walls of 40)).

Orienting the jetting direction oblique to the surface of the substrate (fig 6, 34) and intersecting the substrate at a location in or adjacent to the gap (col 3, lines 49-53) Moving the jetting valve in the first axis of motion with respect to the substrate (col 3, lines 58-62); and while moving the jetting valve, iterating the steps of causing, thereafter causing, breaking and applying to apply a linear pattern of viscous material on the substrate adjacent the gap (col3, line 9-10).

Claim 6 has all the limitations of claim 4, '847 teaches the device having a sidewall nonparallel to the surface of the substrate and substantially parallel to the first axis of motion as discussed above; the method further comprising: orienting the jetting direction oblique to the surface of the substrate (fig 4, (32)) and directed generally toward both the surface of the substrate and the sidewall of the device (fig 6, (32,40)) with a projection of the jetting direction on the surface of the substrate being substantially perpendicular to the sidewall of the component(fig 6); moving the jetting valve in the first axis of motion with respect to the substrate (see above); and while moving the jetting valve, iterating the steps of causing, thereafter causing, breaking and

applying to apply a linear pattern of viscous material on the substrate adjacent the sidewall of the device as discussed above.

Claim 7 has all the limitations of claim 4, '847 teach that the sidewall of the device is substantially perpendicular to the surface of the substrate (fig 6, (40,42)).

Claim 8 has all the limits of claim 2, '847 teaches the positioner is operable to move the jetting valve in a second axis (the second axis of motion here will be the X [fig 1, (12), fig 4, (26)] axis of motion nonparallel to the first axis of motion (fig 1, (14,12)) and the substrate has a device mounted thereon with a first sidewall nonparallel to the surface of the substrate and substantially parallel to the first axis of motion (see above), the device further having a second sidewall (right side of 40) nonparallel to the surface of the substrate and substantially parallel to the second axis of motion (fig 4, (26,42), the method further comprising: orienting the jetting direction oblique(fig 4) to the surface of the substrate and directed generally toward both the surface of the substrate and the sidewall of the device (fig 6, (32,40 (right side))) with a projection of the jetting direction on the substrate being oblique to the first and second sidewalls; moving the jetting valve in the first axis of motion with respect to the substrate; simultaneously moving the jetting valve and iterating the steps of causing, breaking and applying to apply a linear pattern of viscous material on the substrate adjacent the first sidewall of the device; thereafter, moving the jetting valve in the second axis (col 2, lines 49-51) of motion with respect to the substrate; and while moving the jetting valve in the second axis of motion, iterating the steps of causing, thereafter causing, breaking and applying to apply a linear pattern

of viscous material on the substrate adjacent the second sidewall of the device (fig 7, (40,42,34)), [col 1 line 59-67], [col 2, line 1-5].

Claim 9 has the limitations of claim 8: see discussion of claim 8 above. '847 teaches the first sidewall and the second sidewall are substantially perpendicular to the surface of the substrate (fig 4, (24, 26, 32, 42)).

Claim 10 has the limitations of claim 2,'847 teaches orienting the jetting direction at a first angle (ϕ) with respect to the surface of the substrate [col 3, lines 51]; moving the jetting valve in the first axis of motion with respect to the substrate; while moving the jetting valve, iterating the steps of causing, thereafter causing, breaking and applying to apply a linear pattern of viscous material to the left side of the substrate as discussed above; orienting the jetting direction at a second angle ($-\phi$) with respect to the surface of the substrate; moving the jetting valve in the first axis of motion with respect to the substrate [col 4, line 16-30]; and while moving the jetting valve, iterating the steps of causing, thereafter causing, breaking and applying to apply a linear pattern of viscous material to the right side of the substrate (see discussion of claim 2 and 6 above).

With respect to claim 11, '847 teaches the viscous material being apply on first and second opposed surfaces of a substrate (fig 6, 40), (left side of 42 and right side of 42 with (40) being about the center); providing a first jetting valve (32) having a first nozzle directing a first viscous material flow in a first jetting direction nonperpendicular to the first surface of the substrate (fig 6, (32) left side of 42); causing the first jetting valve to propel a first flow of the viscous material through the first nozzle with a forward momentum in the first jetting direction; breaking the first flow of the viscous material

using the forward momentum to form a first droplet of the viscous material as discussed above; applying the first droplet of the viscous material to the first surface of the substrate; providing a second jetting valve (fig 6, 34) having a second nozzle directing a second viscous material flow in a second jetting direction nonperpendicular (fig 7, 34) to the second surface of the substrate; causing the second jetting valve to propel a second flow of the viscous material through the second nozzle with a forward momentum in the second jetting direction; breaking the second flow of the viscous material using the forward momentum to form a second droplet of the viscous material; and applying the second droplet of the viscous material to the second surface of the substrate (right side of 42), [col 4, lines 33-45] also see discussion above.
'847 does not teach droplet made by valve seat and valve elements. However, '957 teach that the valve member will compress the valve seat material and block the outlet bore as a minute droplet is dispensed [col 4, line 26-29] perpendicular to the surface of the substrate [fig 5]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the valve of '957 to apply the droplets of applicant because '957 teaches that it is a suitable apparatus for droplet application.

Claim 12 have all the limitations of claim 11, '847 teaches that the steps of causing and thereafter causing associated with the first jetting valve and the steps of causing and thereafter causing associated with the second jetting valve occur substantially simultaneously [col 3, lines 58-61].

With specific regard to claim 14, '847 does teach moving the jetting valve along X, Y and Z axes of motion, the X and Y axes of motion being substantially parallel to the

respective first and second sidewalls, the jetting valve being pivotable in a first angular axis of motion rotatable about the Z axis of motion and a second angular axis of motion rotatable about one of the X and Y axes of motion; a wetted area on the substrate produced by the droplet being reduced by the jetting direction being oblique to the substrate. The claimed feature of a reduced wetting area must either inherently be performed by the disclosed process or such result occurs because of essential limitations which are not present in the claims. Feature of claims 2, 4, 6 and 8 have been set forth above.

'847 teaches moving the jetting valve along X, Y and Z axes of motion (fig 1, (18)) the X and Y axes of motion being substantially parallel to the respective first and second sidewalls (see above discussion), the jetting valve being pivotable in a first angular axis of motion rotatable about the Z axis of motion [col 3, lines 14-16] and a second angular axis of motion rotatable about one of the X and Y axes of motion [col 4, lines 58-62]. '847 does not teach droplet made by valve seat and valve elements. However, '957 teach that the valve member will compress the valve seat material and block the outlet bore as a minute droplet is dispensed [col 4, line 26-29]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the valve of '957 to apply the droplets of applicant because '957 teaches that it is a suitable apparatus for droplet application.

With respect to claim 15, it teaches all the features in claim 14. Features of claim 14 have been set forth above.

Claims 16 and 17 taught substantially for reason set forth in claim 11 above. '847 teaches a- jetting valve being pivotable on the positioner [col 2, line 37-40, col 3, line 14-16]. Pivoting the jetting valve [col 4, lines 24-29] to propel a flow of the viscous material through the nozzle with a forward momentum in the jetting direction. Applying the viscous material droplet to the surface of the substrate [col 5, lines 10-14], a wetted area on the substrate produced by the viscous material droplet being reduced by the jetting direction being non perpendicular to the substrate (the claim feature of reduced wetted area must either inherently be performed by the disclosed process or such results occurs because of essential limitations which are not present in the claims.

Claim 19 teaches everything in claim 1, and features of claim 1 have been set forth above.

Claim 20 teaches everything in claim 1 plus providing a jetting valve having a nozzle directing the material flow in a jetting direction nonperpendicular to the substrate without having to pivot the nozzle. Features of claim 1 have been set forth above. '459 teaches a jetting valve [fig 4, 82] having a nozzle [fig 4, 80] directing the material flow in a jetting direction nonperpendicular [col 2, lines 23-26] to the substrate without having to pivot the nozzle [fig 1, 80], [col 6, lines 8 – 11]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have a jetting valve having a nozzle directing the material flow in a jetting direction nonperpendicular to the substrate without having to pivot the nozzle with reasonable expectation of success because '459 teaches that it is a suitable method.

Claim 21 is rejected. 847, 459, and 957 teach the limitation of claim 1 as discussed above and 847 further teaches applying the droplets to the surface comprises depositing the droplets (32) on the surface at a location spaced from the sidewall of the device(40) [847, fig.6], in fact the droplets are spaced from the other sidewall of the device(40).

Claims 22-23 are rejected. 847, 459, and 957 teach the limitation of claim 21 as discussed above, 847 teaches the device(40) is on the surface (circuit board, 42) in which the viscous material is jetted toward it(fig .6) and 957 teaches the viscous material is solder [column 1 lines 16-25]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of non contact dispensing as 847 teaches where the viscous material is solder as 957 teaches. The solder material inherently moves under the device by capillary forces and make the device to attach to the substrate.

Claim 24 is rejected. 847, 459, and 957 teach the limitation of claim 1 as discussed above and 847 further teaches the droplets of material is applied to the surface is deposited on the surface without contacting the first side wall[847, fig. 6].

Claims 25-26 are rejected. 847, 459, and 957 teach the limitation of claim 24 as discussed above, 847 teaches the device(40) is on the surface (circuit board, 42) in which the viscous material is jetted toward it(fig .6) and 957 teaches the viscous material is solder [column 1 lines 16-25]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of non contact dispensing as 847 teaches where the viscous material is solder as 957 teaches.

The solder material inherently moves under the device by capillary forces and make the device to attaché to the substrate.

Response to Argument

Applicant's arguments filed 05/19/08 have been fully considered but they are not persuasive. Applicant argues by combining Matthias and Messerly non of the devices work for intended purpose and the air directed by atomizing holes 6 would cover the discrete droplets rather than a continues stream of the liquid resin. The examiner disagrees. In fact the claim is not required to have a stream of the resin. The applicant argues some of the reinforcing material may not be wetted. The examiner here notes that as applicant accepted some of the material will be wetted and the claim does not require the entire material to be wet. The applicant further argues the wetted area produced by the atomized droplets would not be less than the wetted area on the substrate resulting from a jetting direction being perpendicular to the surface of the substrate. The examiner disagrees; in fact any person with ordinary skill in art can change the ratio between the wetted area produced by the atomized droplets and the wetted area on the substrate resulting from a jetting direction being perpendicular to the surface, by moving the substrate from the nozzle.

3. The applicant argues any person with ordinary skill in art would not combine Hynes, Hogan and Messerly. The examiner does not agree. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of

references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Briget P. Ngampa whose telephone number is 571-270-1866. The examiner can normally be reached on M-F, 830-4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tabassom T. Tadayyon-Eslami/

Examiner, Art Unit 1792

/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1792